

Remarks/Arguments**Claim Amendments and Specification Support**

Claims 1 to 20, 25, 26, 31, 32, 37, 38, 43-46, and 48-50 remain in this application, and claim 51 is added by this Second Amendment.

All specification-paragraph numbers below are, unless explicitly indicated otherwise, to the numbering of the application as filed, and not paragraph numbers as published.

Claim 1 has been amended in form to a system, and to more precisely claim this embodiment of a self-protecting barrier system for retarding fire, and further to distinguish over Bumbarger, with the limitations of: (a) a substantially unburned first fabric, (b) hydrated superabsorbent polymer (i) at 100 °C and (ii) substantially filling the volumetric capacity of the pockets, (c) a fire adjacent the exterior fabric, and (d) a first layer of steam between the surface of the exterior fabric and the fire. The amendments to claim 1 are supported at least at specification: paragraphs 14, 15, 47, 48 and 63, and Fig. 6 (as to unburned and first fabric); paragraphs 14, 21 and 72 (as to 100 °C); paragraphs 43-44 and Fig. 5-8 (as to substantially filling); paragraphs 12-15, 48 and 58-76 of Examples 1-2, and Fig. 6 (as to adjacent fire); and paragraphs 14-15 and Fig. 6 (as to steam layer between).

Claims 2-9, all ultimately dependent on claim 1, are each amended to conform to the claim 1 “self-protecting” and “system” terminology, and addition amendments are listed below.

Claim 6 is also amended to substitute, for the limitation of loose unhydrated polymer, that the hydrated superabsorbent polymer is a substantially continuous matrix, which substantially fills the pockets, and these amendments are supported at specification paragraph 14 and 24, and Fig. 5-8 (see 16').

Claim 7 is also amended by deleting the superseded two-sheets terminology and adding (a) a water-permeable, substantially unburned interior fabric opposite the first fabric, (b) fuel adjacent the second fabric, and (c) steam between the second fabric and fuel, and these amendments are supported at specification: paragraphs 20, 21 and 38, and Fig. 6 (as to second water-permeable unburned surface and interior); paragraphs 12 and 13, and Fig. 6 (as to fuel adjacent the second surface); and paragraph 21 (steaming through water-permeable surfaces).

Claims 8 and 9, dependent on claim 7 as filed, are now listed with the correct dependency (the incorrect dependency in these "original" claims of the prior claim listing being an inadvertent error of undetermined origin) and are also amended to conform to the "first fabric" and "second fabric" terminology, and to add the limitations that the fabrics are porous, hydrophilic and normally flammable which are supported at specification paragraphs 21 (particularly lines 10-14), 47 and 48.

Claims 10-13, each originally dependent on claim 1 and then rewritten in the first Amendment to independent form in view of the now-withdrawn indication of allowability (if so rewritten), are revised back to their dependency from claim 1 with (a) the elimination of elements recited in claim 1, (b) to conform to the amended claim 1 "self-protecting" and "system" terminology and (c) for form, to affirmatively recite a second barrier (claims 10 and 11) and a building (claims 12-13).

Independent device claim 14 is amended to more precisely define the self-protected barrier and further distinguish over Bumbarger with (a) first and second fabric layers (instead of a pair), (b) a water-permeable first layer, and (c) pockets are (i) slack and (ii) hold substantially only a loose superabsorbent polymer. These amendments are supported at specification: paragraph 8 and elsewhere (as to two layers, at least one water-permeable); and paragraphs 24 and 43 (lines 1-5), and Fig. 3 (as to slack and substantially only loose superabsorbent polymer).

Independent method claim 15 is amended in form and to more precisely define the hydration step with the limitations of (a) hydrating with a sufficient amount of water, (b) to expand the superabsorbent polymer (i) to essentially fill the volumetric capacity (ii) with a substantially continuous matrix of hydrated superabsorbent polymer and (iii) push the pockets out to tautness. These amendments are supported at specification paragraphs 14, 24, 43 and 44, and Fig. 5-8(see 16'and 34).

Claims 16-18, dependent on claim 15, are amended to conform to the "self-protecting" terminology. Claim 16 is also amended to substitute "object" for "building" to correct the antecedent-basis error carried through from the original claim as filed. Claim 17 is also amended (a) to conform to the substantially continuous matrix terminology of claim 15 and (b) to further recite that the evaporation or boiling step is at a temperature of about 100 °C, and this amendment is supported at specification par. 14, 21 and 71. Claim 18 is also listed with its correct dependency to claim 17, as filed.

Claims 21-24, 27-30, 33-36 and 39-42, each dependent on one of claims 10-13 (which, as noted above, are amended back to a dependency on claim 1), are canceled as prolix in view of the return of claims 10-13 to dependent status.

Claims 19, 20, 25, 26, 31, 32, 37 and 38, each also dependent on one of claims 10-13 (which, as noted above, are amended back to a dependency on claim 1), are amended to conform to the “self-protecting fire-retardant” and “system” terminology of ultimately of claim 1, and further to include in each the limitations of the exterior fabric being porous, hydrophilic and flammable, and these amendments are supported at specification paragraph 21 (particularly lines 10-14).

Claims 43-46 and 48, each dependent on claim 14, are amended for form to include claim 14’s self-protecting fire-retardant terminology. Claims 43 and 44 are also amended to include the limitation that the first fabric is porous, hydrophilic and flammable (in each), and these amendments are supported at specification paragraph 21 (particularly lines 10-14). Claim 48 is also amended to conform to amended claim 14 by the deletion of the two-sheets limitations, and further to limit the second fabric layer to being water-permeable, which is supported at specification paragraphs 20, 21 and 38.

Claim 47 is canceled because its limitations are incorporated into amended claim 14.

Independent method claim 49 is amended to more precisely define this embodiment of the invention, and further distinguish over Bumbarger, with the limitations of (a) a self-protecting barrier with a first surface both facing and exposed to the flames, (b) pockets containing a substantially continuous matrix of water and superabsorbent polymer hydrated with that water, (c) the volatilization step is at about 100 °C., and (d) the additional steps of deterring ignition of the fabric and preventing flames from reaching the fuel by substantially extinguishing the flames with the steam layer. These amendments are supported at specification: paragraphs 12, 13 and 58-71 of

Examples 1-3, and Fig. 6 (as to facing and exposed); paragraphs 14 and 24, and Fig. 1-8 (as to substantially continuous matrix); paragraphs 14, 21 and 71 (as to 100 °C.); and paragraphs 12, 13 and 15 (as to deterring fabric ignition and prevention flames from reaching fuel by extinguishing flames).

Claim 50, dependent on claim 49, is amended for form to recite the affirmative step “dissipating” in substitution for the passive “allowing to dissipate” step.

New claim 51, dependent on claim 49, adds the limitations of (a) the second side of the barrier being water permeable and facing the fuel, and (b) the step of forming steam at the second surface. These additional limitations are supported at specification paragraphs 20 (particularly lines 7-11) and 21 (particularly lines 1-10).

The Declaration of John C. Miller under 37 CFR 1.132

This Declaration (“Miller Declaration”) by one of the two co-inventors, who is a Ph.D. chemist, and its Exhibits 1-12, attached hereto and incorporated hereinto, provide informative contributions on the topics of (Section A) the insulation impact of Bumbarger’s fiberfill batting, (Section B) Bumbarger’s evaporation versus the present invention’s steaming, (Section C) Bumbarger’s unexploited co-existence with critical needs in the wildfire-fighting area, (Section D) Bumbarger’s inadequacies for the systems and methods of the present invention, (Section E) a video-taped demonstration of the striking efficacies of the present invention in fire retardation, and (Section F) a synopsis on the present inventions capabilities versus the critical wild-fire fighting needs.

Since both the claim amendments and the Miller Declaration are at least in part directed to distinguishing the present invention from Bumbarger, the discussion of the

specifics of Miller Declaration is included with the discussion of the claims, as amended, below.

Claim Objections – Informalities

Claim informalities in claim 16-18 have been corrected in the amendments above, namely, (a) “object” substituted for “building” in claim 16 to conform to the “object” terminology of claim 15, (b) the hydration with water included in claim 15 which provides antecedent basis for “said water” of claim 17, and (c) listing claim 18’s dependency on claim 17, rather than claim 15. The first two originally-filed claim informalities were inadvertently overlooked in applicant’s first Amendment, and the third was an inadvertent error. Applicant believes the required corrections to be fully made.

Claim Rejections – 35 USC § 112, First Paragraph

Claims 1-9 stand rejected under 35 USC § 112, first paragraph, as failing to comply with the written description requirement. The basis for these rejections is the inclusion of subject matter which the examiner believes was not described in the specification in such a way to reasonably convey to one skilled in the art that the inventors had possession of the claimed invention at the time the application was filed.

Since claims 12-13, 19, 20, 25, 26, 31, 32, 37, 38, 43 and 44 now also depend ultimately on claim 1, applicant includes all these claims in the traverse of the rejections below.

An application is not deficient under 35 USC 112, first paragraph unless the written description is not adequate to identify what the application has invented, or when the disclosure is insufficient to enable one skilled in the art to make and use the invention without undue experimentation. The system of these claims is well described in the

application, namely at paragraphs 12-16, 48 and 58-71 of Examples 1-3. The system of claim 1 is a combination of a hydrated barrier, a fire and a first layer of steam between the barrier's first surface and the fire. This is the system embodied in the method. The system is well described by the disclosures regarding the use of the barriers and regarding the method of the invention in the specification, and also described as within the invention because it is nowhere suggested that the system embodied in the method is outside of or beyond the invention.

There can be no issue that applicant has reasonably conveyed that they were in possession of the claimed invention, namely the system of claim 1 and its dependent claims, at the time the application was filed. How the specification accomplishes conveying that the inventor was in possession of the claimed invention is not material. See *In re Herschler*, 591 F.2d 693, 700-01, 200 USPQ 711, 717 (CCPA 1979) and *In re Kaslow*, 707 F.2d 1366, 217 USPQ 1089 (Fed. Cir. 1983). The claimed invention need not be described literally, i.e., using the same terms, in order for the disclosure to satisfy the description requirement. See MPEP 2106, V. (B.)(1.) The specification need not explicitly recite "device, system and method" to bridge device and method claims with system claims, and an applicant is free to change what he or she regards as the invention during prosecution of the application. See MPEP Section 2106, V. (A.)(1.) at page 2100-19. Further, the system of these claims are within the statutory class of a manufacture because the system, as recited in claim 1 and its dependent claims, is neither a substantially unaltered thing occurring in nature, nor a scientific principle divorced from any tangible structure. Compare *Ex parte Grayson*, 51 USPQ 413 (Bd. App. 1941) and *O'Reilly v. Morse*, 56 U.S. 62 (1854).)

Claim Rejections – 35 USC § 112, Second Paragraph

Claims 1-9 stand rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. The basis for these rejections is the recitation of a layer of steam at the surface, which the examiner believes “is not clear as to how the steam is provided and as disclosed is not provided as a separate element but as a result of exposure [to fire,] which is not provided.”

Since claims 12-13, 19, 20, 25, 26, 31, 32, 37, 38, 43 and 44 now also depend ultimately on claim 1, applicant includes all these claims in the traverse of the rejections below.

Claim 1 has been amended to include fire adjacent the barrier as an element of the system, and the examiner already recognizes that the production of steam upon exposure to fire is disclosed. These limitations of claim 1 are of course incorporated into each of these claims. It is believed that any inadvertent failure to particularly point out, and distinctly claim, the subject matter regarded as the invention has been corrected by the addition of the recitation of an adjacent fire in claim 1.

Claim Rejections – 35 USC § 103Section 103 – Summary of the Rejections

Claims 1-9, 14, 15, 17, 18 and 43 to-50 stand rejected under 35 USC § 103 as unpatentable over Bumbarger. Claims 10-13, 16 and 19, 20, 25, 26, 31, 32, 37 and 38 stand rejected under 35 USC § 103(a) as unpatentable over Bumbarger in view of Rogers et al. Since claims 51 is newly added, applicant also includes this claim in the traverse of the rejections below.

Again, although not specified by the examiner, it is clear the Bumbarger citations are to Bumbarger '912, and not to Bumbarger '977.

The examiner's position is that Bumbarger discloses a barrier with a pair of fabric sheets 12/16, sheet 12 being water permeable, joined together to form pockets, the pockets filled with a superabsorbent polymer. The examiner's further position is that it would have been obvious to provide the number of pockets per square foot, the pocket's volumetric capacity range, and the amount of polymer because

"Bumbarger teaches that the quilted seams form pockets for the absorbent particles and therefore, the more pockets per square foot the greater protection would be provided. Bumbarger controls the amount of polymer proportional to the size of the pocket."

The examiner further equates Bumbarger's vaporization of water in the pockets with the present invention's steaming, contends the specific superabsorbent polymer is an obvious design choice and contends Bumbarger's apparatus is capable of performing the method steps as claimed.

As to the § 103(a) rejections, the examiner notes that Rogers et al. discloses fire barriers with fastening means/fasteners for connecting barriers together, that Bumbarger discloses that its apparatus can be used as a blanket to provide protection from fire, and it would be obvious to provide fasteners for

"the barrier of Bumbarger, as taught by Rogers et al., since with such modifications "the (Bumbarger) barriers could be connected together in multiple formations such that different sized objects or buildings or multiple people at one time could be protected by the barriers."

Traverse Summary – All Claims

As to all claims, as elaborated below, Bumbarger neither discloses nor suggests (a) a barrier, (b) a barrier protecting objects or buildings which are fuel for fire, or (c)

pockets holding either substantially only (i) loose unhydrated superabsorbent or (2) hydrated superabsorbent polymer filling the pockets.

Traverse Summary – System Claims 1-13, 19, 20, 25, 26, 31, 32, 37 and 38

Further, as to system claim 1 and its dependent claims 2-13, 19, 20, 25, 26, 31, 32, 37 and 38, Bumbarger neither discloses nor suggests a self protecting barrier system for retarding fire having:

(d) a barrier having a water-permeable and unburned fabric, (e) holding superabsorbent polymer at about 100 °C, (f) an adjacent fire and (g) a layer of steam between,

or further (as to claim 6) (h) a continuous matrix of hydrated superabsorbent polymer,

or further (as to claim 7-9) (i) a second water-permeable and unburned fabric, (j) adjacent fuel and (k) steam therebetween,

or further (as to claims 8, 9, 19, 20, 25, 26, 31, 32, 37 and 38) (l) a first fabric that is porous, hydrophilic and normally flammable.

Traverse Summary – Barrier Claims 14, 43-46 and 48

Further, as to barrier claim 14 and its dependent claims 43-46 and 48, Bumbarger neither discloses nor suggests a pocketed barrier in which (m) the pockets are substantially slack,

or further (as to claims 43-44) (n) a first fabric that is porous, hydrophilic and normally flammable,

or further (as to claim 48) (o) a second water-permeable fabric.

Traverse Summary – Method Claims 15-18

Further as to method claim 15 and its dependent claims 16-18, Bumbarger neither discloses or suggests a method of retarding fire from burning an object including (p) covering an object with a plurality of barriers and (q) hydrating the superabsorbent polymer therein to fill out the pockets to tautness with a substantially continuous matrix of hydrated polymer,

or further (as to claim 17) (r) evaporating or boiling hydration water at 100 °C to form a steam layer,

or further (as to claim 18) (s) quenching fire with the steam layer.

Traverse Summary – Method Claims 49-51

Further, as to method claim 49 and its dependent claims 50-51, Bumbarger neither discloses or suggests a method of isolating fuel from the flames of a fire including (t) providing a barrier facing and exposed to flames between fire and fuel, (u) volatilizing hydration water at 100 °C to form a steam layer and (v) deterring fabric ignition and preventing flames from reaching the fuel by extinguishing flames with the steam layer,

or further (as to claim 50) (w) dissipating the steam layer and (x) removing the barrier,

or further (as to claim 51) (y) steaming between the barrier and fuel.

Traverse Summary – Obvious/Nonobvious Analysis

The presence of a property not possessed by the prior art is evidence of nonobviousness. *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963). The absence of an expected property is evidence of nonobviousness. *Ex parte Mead Johnson & Co.*, 227 USPQ 78, (Bd. Pat. App. & Inter. 1985).

The totality of the record must be considered in determining whether a claimed invention is obvious. *In re Chu*, 66 F.3d 292, 298-99, 36 USPQ2d 1089, 1094-95 (Fed. Cir. 1995).

A conclusion of obviousness can only take into account knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made, and cannot include knowledge gleaned only from applicant's disclosure. Compare *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

As to combining or modifying references, some teaching, suggestion or motivation to do so must be found in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Traverse - Bumbarger's Composite

Bumbarger discloses a multi-layered composite for the fabrication of garments and other items (blankets, compresses) for: (1) body temperature control (cooling or heating the user's body), (2) body protection from extreme temperatures (intense heat or cold); (3) protection of the body from impact injuries (physical injury). See for instance Bumbarger at column 1, lines 34-44.

Bumbarger discloses a composite comprised of, from top to bottom (outside to inside), optional protective (fire-resistant) layer 20, retainer or retention layer 12, filler layer 14 and water-proof conductor layer 16, sometimes using a waterproof coating 18.

The retainer layer 12 is for retention of the filler layer 14 between it and the conductor layer 16. Bumbarger at column 2, lines 2-4. The retainer layer 12 is a fabric

of a porosity which permits the passage of liquid, such as water. Bumbarger at column 2, lines 12-15. For use in the vicinity of fire, the retainer layer 12 is sprayed with a fire repellent coating, or if required, an additional complete or partial discrete layer of fire resistant material may be utilized. Bumbarger at column 3, lines 55-58. The retainer layer illustrated in FIG. 1 is a tightly-woven high-strength fabric such as "NONEX" with a coating 13 on its outer side to protect it from damage from external dangers such as fire and/or impact. Bumbarger at column 4, lines 54-60. Provisions must be made to permit the passage of liquid either through or around the coating 13 to facilitate soaking of the absorbent particles in the filler layer 14, such as piercing the coating 13 with a multitude of minute punctures. Bumbarger at column 4, lines 60-65. In FIG. 2 a separate fire resistant layer 20 is provided above (outside) of the retainer layer 12. Such a discrete outside layer 20 is used when the user will be subjected to fire or heat so extreme as to require maximum possible fire protection. Bumbarger at column 5, lines 26-20. Bumbarger's examples of the fire-resistant layer 20 consist of "NONEX", high grade cotton if a discrete protective layer is used, and if fire protection without a discrete protective layer is desired, cotton-FR (cotton fabric sprayed with fire retardant). Bumbarger at column 5, lines 30-33, and column 6, lines 46-50.

The filler layer 14, below (inside) of the retainer layer 12, is a fiberfill batting impregnated with liquid absorbent particles which are typically super-absorbent polymers. Bumbarger at column 2, lines 8-12. When an application relates to protection of one's body from high temperatures, the composite is soaked until the polymer particles reach 50% to 90% total saturation. Bumbarger at column 2, lines 17-21. The particles 17 are distributed throughout fiberfill batting 15 of the filler layer 14. Bumbarger at column

4, line 65, to column 5, line 1. A suitable filler layer material is "ARMADA" E. 89 and suitable impregnated particles therein are cross-linked polyacrylamide. Bumbarger at column 6, lines 41-45.

The conductive layer 16 is typically formed of a waterproof but breathable material. Bumbarger at column 2, lines 7-8. The conductive layer 16 may also be formed of "NONEX" but its inner surface (the surface which in use is to be directly against or in close proximity to a person's body) is covered with a waterproof but breathable coating 18 such as "BREATHE TEX". Bumbarger at column 5, lines 4-9. The coating 18 prevents liquid contained in the filler layer 14 from coming into contact with the body of the user and also provides an effective thermal conductor which exposes the body of the user to the approximate temperature of the liquid retaining particles 17. Bumbarger at column 5, lines 13-18. The coating 18 will also permit the passage of moisture in vapor form from the body of the user to the absorbent particles 17 for absorption thereby, provided that the particles 17 are not totally saturated. Bumbarger at column 5, lines 18-22. A suitable material for the conductive layer 16 is "NOMEX" and a coating of "BREATHE TEX" provides a breathable but waterproof covering with is an excellent thermal conductor and provides a cool dry surface to the body of the wearer. Bumbarger at column 6, lines 35-39.

Traverse - Bumbarger's composite's operational particulars

Bumbarger's composite provides a covering which protects and/or comforts the body of a person. Bumbarger at column 1, lines 5-12. The composite protects a person's body from extreme heat or cold and from physical impact injury. Bumbarger at column 1, lines 12-14. The composite is also utilized to control the temperature of a person by

providing warming or cooling as needed. Bumbarger at column 1, lines 14-16. The composite is configured for fabrication of garments for body temperature and protection of the body from extreme temperatures and impact injuries. Bumbarger at column 1, lines 36-40. The composite is suited to fabrication of blankets, compresses and a variety of items for cooling or heating the body and for protecting the body from intense heat or cold as well as from physical injury. Bumbarger at column 1, lines 40-44. Garments made from the composite are effective for use by firemen and others, and foundry and bakery workers who are exposed for long periods of time to extremely high temperatures, and for persons exposed to extremely low temperatures. Bumbarger at column 1, lines 44-51. The composite is suited for fabrication of special use blankets for cooling and warming the user, and provide protection from fire and physical impacts. Bumbarger at column 1, lines 51-55. In catastrophes such as wind storms, fires and wartime attacks, blankets will provide protection against burns or impact injuries to bedridden persons. Bumbarger at column 1, lines 55-61. Blankets soaked in a warm liquid provide a means of warming persons exposed to cold, particularly a person suffering from hypothermia. Bumbarger at column 1, lines 62-65.

When the application of the composite relates to the protection of one's body from high temperatures, the composite is soaked in a liquid, such as water, until the polymer particles reach a point equal to 50% to 90% of total saturation, which requires submersion in water for about 15 to 25 minutes. Bumbarger at column 2, lines 17-26.

In a soaked condition, a garment fabricated from the composite provides body protection against intense heat in multiple ways. Bumbarger at column 6, lines 3-6. (1st) The retainer layer 12 may be provided with a heat resistant coating. Bumbarger at

column 6, lines 7-9. (2nd) The liquid (water) contained by the particles 17 in the filler layer 14 provides a thermal insulator between the retainer layer 12 and the conductive layer 16 adjacent a person's body. Bumbarger at column 6, lines 10-13. (3rd) As the retainer layer 12 is exposed to heat, the liquid within the filler layer 14 begins to vaporize and pass slowly through the retainer layer 12 thus creating a moist film on the outer surface of the retainer layer 12. The moisture itself resists the heat and protects the outer surface of the retainer layer 12. Bumbarger at column 6, lines 14-18. (4th) As the moisture on the retainer layer 12 evaporates, an evaporative cooling occurs which further cools the retainer layer 12, and the filler layer 14 provides a continuation of these cooling processes. Bumbarger at column 6, lines 19-23. (5th) If the user is perspiring, the perspiration will largely evaporate, cooling the user, and the evaporative moisture will then be carried in the form of humid air through the breathable conductive layer and into the filler layer for absorption by the partially saturated absorption particles. Bumbarger at column 6, lines 24-28. To facilitate the fifth way in which the composite provides body protection, the particles are not totally saturated during pre-use soaking and the conductive layer is a good thermal conductor, and is also water proof yet porous enough to be breathable. Bumbarger at column 6, lines 29-34.

Bumbarger says that the composite in garments meets the requirements for use by firemen, policemen and military personnel. For a fireman, the retainer layer may simply be sprayed with a fire repellent coating, and if required an additional discrete layer of fire resistant material may be easily added. Bumbarger at column 8, lines 24-32. After soaking, the composite provides an extremely effective protection to the wearer not only against extreme heat but also against injury from falling debris encountered by firemen

within a burning building. Bumbarger at column 8, lines 33-37. A fireman fighting a forest fire may be provided with additional leg protection from underbrush as well as from the intense heat of the fire. Bumbarger at column 9, lines 16-21. A soaked composite blanket can be used in forest-fire fighting, namely in the practice lying down in a quickly-prepared trench, covering one's body with a blanket and allowing the fire to pass over when backfires close any means of escaping the flame, where a soaked composite blanket provides protection for this purpose. Bumbarger at column 9, lines 21-30. With respect to an application requiring protection from intense heat, 50% to 90% saturation is appropriate so as to provide a means of absorbing the user's perspiration, which will evaporate, thus cooling the user, and then be carried in the form of humid air through the breathable conductive layer into the filler layer for absorption. Bumbarger at column 9, lines 33-41.

Traverse - Bumbarger Does Not Disclose a Barrier

The examiner calls Bumbarger's composite a barrier. A barrier is an item that obstructs or separates, or a structure intended to prevent access, or keep one place separate from another. Neither the "barrier" word nor a barrier function is found in Bumbarger.

Instead, as illustrated in the description of Bumbarger above, Bumbarger's composite is body-temperature-control article. It protects a body by providing warming and cooling as needed. Bumbarger at column 1, lines 5-16, 34-65. In garment form, it protects against intense heat via (1) the material or coating providing heat resistance, (2) the absorbed water providing thermal insulation, (3) the moist film providing heat resistance and outer-surface protection, (4) the moisture-evaporation providing

evaporative cooling, and (5) the conductive layer providing thermal conduction and outlet for perspiration-sourced humid air. Bumbarger at column 6, lines 3-24. In blanket form, it can be used to protect fire fighters in backfire trenches and bedridden persons from intense heat, particularly from absorbing the person's perspiration. Bumbarger at column 9, lines 21-41.

No obstruction or access-prevention function is disclosed in Bumbarger, particularly as to objects and buildings, but instead insulation-driven body-temperature control, to warm or cool as needed, and absorb perspiration.

A barrier is a required element in each of the systems, devices and methods of the present claims, and a barrier explicitly protecting on object or building or generally fuel is a required element in system claims 7, 12 and 13 (and claims 8, 9, 31, 32, 37 and 38 dependent therefrom) and method claims 15 and 49 (and claims 16-18, 50 and 51 dependent therefrom).

Traverse - Bumbarger Discloses a Batting-Filled Insulator, Distinct from the Present Hydrated Matrix Conductor of the Present Invention

As explicated in the Miller Declaration, par. 5-18 (includes Section A), Bumbarger's pockets hold more than superabsorbent polymer. The pockets hold fiberfill batting, into which its superabsorbent particles are dispersed. See Miller Declaration at par. 5-7 and Bumbarger at col. 2, lines 8-10, and at col. 4, line 65, to col. 5, line 4.

Fiberfill is a synthetic-fiber insulator, and batting is a layer of insulation. See Miller Declaration at par. 8, and Group Exhibits 1 and 2. (Bumbarger's "ARMADA" E. 89" fiberfill batting is unknown. See Miller Declaration at par. 9 and Exhibit 3.)

Bumbarger's fiberfill batting would not be affected when its composite is soaked with water and the dispersed absorbent particles hydrated. See Miller Declaration at par. 10 and Bumbarger at col. 4, lines 65-65. Therefore Bumbarger's pockets, upon hydration, continue to hold fiberfill batting in addition to the now-hydrated superabsorbent polymer dispersed within the fiberfill batting.

Bumbarger discloses that the material inside its pockets, namely a discontinuous matrix of fiberfill batting and hydrated superabsorbent polymer, is a body-protecting thermal insulator. (Bumbarger's attribution of the insulation property to just the water alone is somewhat imprecise because water is a thermal conductor, not a thermal insulator.) See Miller Declaration at par. 11 and 12, Table 23-3 of Exhibit 4 and Bumbarger at col. 6, lines 2-13.

Ball-parking the thermal conductivity of Bumbarger's fiberfill batting at the level of moderate insulators, such as cork and glass wool, it is seen that barrier of the present invention, with its continuous matrix of superabsorbent polymer, has a heat transfer rate that is from about 36 to about 140 times faster than the heat transfer rate of a like barrier filled with Bumbarger's discontinuous matrix of fiberfill batting and hydrated superabsorbent polymer, depending on the amount of fiberfill batting. See Miller Declaration at par. 12-14 and Exhibits 4 and 5. This strikingly demonstrates the insulation impact of the fiberfill batting in Bumbarger's filler layer. The fiberfill batting converts an otherwise thermal-conducting hydrated-superabsorbent matrix into a thermal insulator, and this is consistent with Bumbarger's claim that its filler layer is a thermal insulator. See Miller Declaration at par. 15.

In the systems, devices and methods of the present invention explicitly described and illustrated in the present application, and explicitly claimed in amended claims 7-9, 48 and 51, both surfaces of the barrier are water permeable, and the fast heat transfer between surfaces creates steaming on both sides, doubly protecting the fuel adjacent the inner surface. See Miller Declaration at par. 16. In broader embodiments, where water-permeability is required of only one surface (all pending claims other than the double-steaming claims 7-9, 48 and 51), the present invention's fast heat transfer boosts the critical heat-buffering property of the barrier, whereby the barrier maintains a temperature no higher than the boiling point of water throughout, from outside to inside. The present invention's fast heat transfer is not, and cannot, be realized in Bumbarger's thermal-insulating discontinuous matrix of fiberfill batting and hydrated superabsorbent. See Miller Declaration, at par. 17-18.

Further, the loose superabsorbent polymer and slack-pockets limitations of claim 14 and its dependent claims 43-46 and 48, permit the barrier of the present invention to be easily stored and manipulated, by folding it into a compact space and storing a plurality of barriers in a small space when they are not needed. See present specification at paragraph 24, particularly lines 9-13, and paragraph 43. Bumbarger's fiberfill batting precludes this property.

Traverse - Bumbarger Does not Disclose Protecting Objects or Buildings

The tying of the Bumbarger and Rogers et al. disclosures rests on the premise that the modification of Bumbarger would be obvious for the purpose of protecting multiple objects, buildings and people at one time. This premise fails because there is nothing in Bumbarger that suggests protecting objects or buildings, and instead only single persons,

and then as to immediate fire protection, only as to a person lacking an escape, lying in a quickly prepared trench. Further, as discussed above, Bumbarger does not disclose a barrier, and as discussed below, the system and method of the present invention cannot be employed for the immediate protection of a person, regardless of whether such person, lacking an escape route, is lying in a trench or is otherwise situated.

Traverse - Bumbarger Neither Discloses nor Suggests Steaming or a Steam Layer

The examiner equates Bumbarger's vapor with steam. As explicated in the Miller Declaration, par. 19-24 (Section B), a steam layer forms on the surface of the present invention's barrier. Bumbarger says that a vapor is formed in or about its composite of Bumbarger, but that vapor is not steam. Neither the "steam" word nor a steam actuality/expectation is found in Bumbarger. See Miller Declaration, at par. 19, and Bumbarger.

Steam is the gas emitted from boiling water or evaporation of water at its boiling temperature of 212 °F (100 °C). In contrast, normal body temperature is 98.6 °F. Obviously Bumbarger's filler layer cannot reasonably be boiling with only the conductive layer between it and the user's body. The perspiration absorption discussed in Bumbarger would be of no concern under such circumstances because the user could not survive. See Miller Declaration at par. 20, and Bumbarger.

In more detail, Bumbarger says that as its retainer layer is exposed to heat, the liquid within the filler layer begins to vaporize and pass slowly through the retainer layer, creating a moist film on the outer surface of the retainer layer. See Bumbarger at col. 6, lines 14-17. Although the word "vaporize" can mean either evaporation or boiling, evaporation and boiling are not the same or equivalent phenomena. It is clear from the

context of Bumbarger that by “vaporize” it means evaporation, not boiling. See Miller Declaration, at par. 21, and Bumbarger.

Further, a steam layer forms on the surface of a barrier of the present invention and acts as a fire extinguisher, preventing ignition of the outer fabric by displacing oxygen at its surface. A person covered by the barrier would not be protected as disclosed in Bumbarger, but instead would be smothered from lack of oxygen. See Miller Declaration, at par. 22.

When the steam layer forms on the surface of a barrier of the present invention in use, the absorbed water inside the barrier is kept at its boiling point, namely 100 °C. or 212 °F., and therefore a person (whose normal body temperature is 98.6 °F) covered by, or clad in, the barrier would be neither cooled nor protected as disclosed in Bumbarger. Such a clad or covered person would not survive. See Miller Declaration, at par. 23.

It is noted here that all amended claims which introduce a steam layer or steam limitation (system claims 1 and 7, and method claims 17, 49 and 51) also introduce the 100 °C parameter for precision and clarity, and to affirmatively distinguish the invention from Bumbarger.

In addition, when the steam layer forms on the surface of a barrier of the present invention in use, it prevents ignition of the outer fabric, and therefore the fire-resistance (non-flammability) required for the composite of Bumbarger would be at best redundant, and quite possibly obstructive. See Miller Declaration, at par. 24.

Traverse - Factors Emphasizing the Nonobviousness of the Claimed Systems and Methods

Factor 1 – Wildfire Fighting Needs

As explicated in the Miller Declaration, par. 25-33 (Section C), nothing in Bumbarger suggests using its composite in the methods or the systems of the present invention, namely as a fire retardant barrier interposed between a fire and fuel, generating a fire-retardant layer of steam to preclude combustion of the fuel. This inescapable observation is corroborated by the continuing void in wildfire-fighting techniques, despite the recognized and colossal need in that field, although Bumbarger issued more than seven years ago (in March of 1999). See Miller Declaration, at par. 25

Wildfires not only scorch acres of land by the hundreds of thousands, and destroy homes by the thousands, they are deadly. Just weeks ago, southern-plains wildfires caused almost a dozen fatalities and the evacuation of 1,900 people. The flames ‘raced across more the 1,000 square miles’ while the resolute fight against the fires ‘from the ground and from the air’ consisted of dousing rooftops with water and dumping retardant from airtankers. See Miller Declaration, at par. 26 and 27, and Exhibit 6.

In Dr. Miller’s home-state of California, 7.8 million acres are developed with housing unit densities meeting the Wildland-Urban Interface criteria and 70 percent thereof (about 5.5 million acres) are at significant risk (very high or extreme risk) to damage from fire. Further, in ten California bioregion there are 3,165,000 housing units, or 26% of the total housing units, which are exposed to significant fire risk. The significant fire risk figure includes 79% of all housing units in the Sierra bioregion and 30% of all housing units in the Bay Area/Delta bioregion. See Miller Declaration, at par. 28 and 29, and Exhibits 7 and 8. The toll of recent fires in and around San Diego was 25 fatalities, more than 3,600 homes and property damage topping \$3.5 billion. See Miller Declaration, at par. 30, and Exhibit 9.

Fire-risks are not limited to California - 80% of all housing units in New Mexico and Wyoming, and 40% to 55% of housing units in other Western states, including California, Washington and Oregon, are on land with fire potential. See Miller Declaration, at par. 31, and Exhibit 9 at page 2.

Residential restrictions mandated by the state of California, and backed-up by requirements of insurers, include defensible-space vegetation/flammable-material clearances around residences and fire-retardant roofing materials. See Miller Declaration, at par. 32, and Group Exhibit 10.

As Dr. Miller summarizes, the fire risk to housing units, many of which are very expensive housing units, is extensive, extreme, very well recognized and long-standing. Yet the resolute fight against the fires 'from the ground and from the air' still consists of dousing rooftops with water and dumping retardant from air-tankers without any adoption of the body-cooling and body-protection composite articles of Bumbarger, which issued in March of 1999, or any method commensurate to that of the present invention. See Miller Declaration, at par. 33.

Factor 2 – Device/System Comparisons

As explicated in the Miller Declaration, par. 34-39 (Section D), a fire requires three components, namely fuel, oxygen, and heat energy sufficient to ignite the fuel (ignition heat). If any one of these components is removed, a fire will not burn. The system, barrier and method of each pending claim isolates fuel from not merely one of these components, but from two, namely from the ignition heat (flames) and from oxygen. See Miller Declaration, at par. 34, and present application at ¶ 23 (¶ 12 of filed application).

When a fire reaches a barrier of the present invention, the water absorbed in barrier forms steam. As the steam is formed, the temperature of the flames is lowered, thus reducing the heat available to propagate the fire. Additionally, the temperature of barrier will not exceed the boiling point of water until all of the water is evaporated, so that barrier cannot reach a temperature that is high enough for ignition. See Miller Declaration, at par. 35, and present application at ¶ 25 (¶ 14 of filed application).

In addition to precluding temperatures high enough for ignition, the steam formed by volatilizing the water absorbed in barrier creates a steam layer at the outer surface of barrier which acts as a fire extinguisher by depriving the fire of oxygen at the surface of barrier, thus quenching any flames that attempt to form at the surface. The steam layer is continually replenished during a fire because the water absorbed by superabsorbent polymer continuously forms steam until the water is exhausted. See Miller Declaration, at par. 36, and present application at ¶ 26 (¶ 15 of filed application).

In addition, the steam layer not only helps to retard the protected fuel from burning, it also self-protects the barrier from burning. See Miller Declaration, at par. 37, and present application at ¶ 26.

Bumbarger teaches that its composite, if used in the vicinity of a fire, must be protected with a separate fire-resistant layer outside of its retainer layer, or at least a fire-retardant coating on the retainer layer. See Bumbarger at col. 5, lines 26-20 and lines 30-33, and col. 6, lines 46-50, and Miller Declaration, at par. 38-39.

In the absence of the disclosures of the present invention, and in the presence of the disclosures of Bumbarger, there is no motivation or impetus to interpose Bumbarger's composite as a self-protected barrier between fuel and flames. To the contrary,

Bumbarger explicitly teaches that its composite itself must be protected when in the vicinity of fire. It is only the disclosures of the present invention that hypothetically might suggest otherwise.

Factor 3 – Present Invention’s Striking Fire Protection and Barrier Self-Protection

As explicated in the Miller Declaration, par. 40-53 (Section E), and as seen in visual record of the test provided in Exhibits 11 and 12 attached thereto, thirty-six wood blocks, each measuring about 2 inches wide, about 2 inches tall and about 6 inches long, were set up as two identical three-layer stacks of eighteen blocks, each layer having six blocks arranged in identical grids with small air spaces in between. Two cotton muslin barriers within amended claims 14, 44-46 and 48, each about 24 inches by about 22.5 inches, were hydrated with water until the pockets expanded to tautness, and then placed over the right-hand stack. Both stacks were blanketed with dry straw, which not only covered each of the stacks, but also filled the space between the stacks and extended beyond the stacks. See Miller Declaration, at par. 40-47, and photos # 1-9 of Exhibit 11.

Then the straw was ignited off some papers stuffed around the edges and allowed to burn. Initially the straw pile burned the same on both sides and in the middle, and then the right-hand side of straw pile over the protected stack becomes essentially burned-out, while burning continues on the left-hand side where the unprotected stack is located. See *med*, at par. 48-49, and photos 11-42 of Exhibit 11. At this point, the straw itself is essentially burned out, and the continuing left-hand side fire is the burning of the unprotected stack. Actual flames from the stack can be seen licking through the burnt straw that remains on top of it. See Miller Declaration, at par. 50-51, and photos # 36-42 of Exhibit 11.

The burnt straw was eventually removed from the location of both stacks. The barriers were lifted off the right-hand stack, held up and turned around for the camera, displaying each on both sides to demonstrate that both were intact, hydrated and essentially unburned. There were only a few cosmetic scorch marks on the outer fabric. See Miller Declaration, at par. 51 and 52, and photos 46-49 of Exhibit 11.

Further, the left-hand stack was completely burned, with nothing remaining except embers and ash, while on the right-hand stack was undamaged. Even the grass on the ground immediately around the right-hand stack was unburned and still green, while the grass around the left-hand stack was charred and blackened. See Miller Declaration, at par. 51 and 53, and photos # 43, 45 and 50-52 of Exhibit 11.

The parameters of this striking demonstration are explicitly within the limitations of system claims 1, 2 and 4-9, barrier claims 14, 44-46 and 48, and method claims 15-18 and 49-51.

Factor 4 –Striking Fire Protection versus Drastic Need

As Dr. Miller explains at par. 54 of the Miller Declaration (Section F), the controlled test described above and recorded (Exhibit 11 photographs and Exhibit 12 video) corroborates his other tests and convincingly establishes that the present invention in all claimed embodiments provides a solution for the well recognized and long-standing need to reduce or eliminate the fire risk to housing units describe above. The present invention provides a weapon for the resolute fight against the fires ‘from the ground and from the air’ which is far more effective than the current dousing of rooftops with water and dumping retardant from air-tankers

Commercialization of the barrier, system and method of the present invention by the inventors is not, however, anticipated unless and until meaningful patent protection is secured, because the required financial investment would be at a great risk unless they secure serious patent protection.

Traverse - The Patentability of Systems and Methods is Not Controlled by the Status of Articles Included or Used Therein

Even if the barriers of claims 14, 43-46 and 48, were obvious (which they are not), that circumstance is not pertinent to the patentability of the systems and methods, because a patentable system can be a combination of known elements, and a patentable method can be a new use of a known manufacture, composition of matter, or material. 35 U.S.C. 100(b) and 101. The only question for the decision-maker is whether the claimed systems and methods would have been obvious to a person of ordinary skill in the field of the invention.

The examiner posits that Bumbarger is capable of performing the method steps of claims 15, 17, 18, 49 and 50 as claimed. First, the fact that a certain result or characteristic might occur and be present in the prior art is insufficient to establish its inherency. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981. Inherencies may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (where claim element held not disclosed in prior art either expressly or inherently). Second, Bumbarger is far off the mark of

disclosing “all but” the property/function limitations of these claims and therefore the burden of proof on inherency does not shift to the applicant. Compare *In re Fitzgerald*, 610 F.2d 67, 205 USPQ 594 (CCPA 1980).

As outlined above in the Traverse-Summary sections, Bumbarger neither discloses nor suggests (a) a barrier, (b) a barrier self-protecting from fire, or (c) pockets substantially filled with hydrated superabsorbent polymer, which structural features are required in each system and method claim (namely system claims 1-13, 19-20, 25-26, 31-32, and 37-38, and method claims 15-18 and 49-51).

Further, Bumbarger neither discloses nor suggests (d) the barrier having a water-permeable and unburned fabric, (e) holding superabsorbent polymer at about 100 °C, (f) an adjacent fire and (g) a layer of steam between, which structural features are required in each system claim (namely system claims 1-13, 19-20, 25-26, 31-32, and 37-38).

Bumbarger also neither discloses nor suggests, and instead its fiberfill batting precludes, (h) the continuous matrix of hydrated superabsorbent polymer, which structural feature is required in system claim 6, and method claims 15-17 and 49-51.

Bumbarger also neither discloses nor suggests (i) the second water-permeable and unburned fabric, (j) adjacent fuel and (k) steam therebetween, which structural features are required in system claims 7-9 and method claims 49-51 as to (i) and method claim 51 as to (k).

Bumbarger also neither discloses nor suggests (l) a first fabric that is porous, hydrophilic and normally flammable, which is a structural feature required of system claims 8, 9, 19, 20, 25, 26, 31, 32, 37 and 38.

The above-enumerated features, required in system and method claims, and not disclosed nor suggested in Bumbarger, are all structural features. The absence of any teaching or suggestion of these structural features not merely preclude any shifting of the burden of proof of inherency to the applicant, they eliminate any inherency issues.

Further, there is nothing in Bumbarger or reference of record, or in the knowledge generally available to one of ordinary skill in the art, that teaches, suggests or provides motivation for, (p) covering an object with a plurality of barriers and (q) hydrating the superabsorbent polymer therein to fill out the pockets to tautness with a substantially continuous matrix of hydrated polymer, which is the method of claim 15 and its dependent claims 16-18, or further (r) evaporating or boiling hydration water at 100 °C to form a steam layer as further required in method claim 17, or (s) quenching fire with the steam layer as required in method claim 18. The only bridge to these claimed methods is the applicant's own disclosures, and applicant's own disclosures cannot be used to fashion a rejection on obviousness. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Further, there is nothing in Bumbarger or any reference of record, or in the knowledge generally available to one of ordinary skill in the art, that teaches, suggests or provides motivation for, isolating fuel from the flames of a fire by (t) providing a barrier facing and exposed to flames between fire and fuel, (u) volatilizing hydration water at 100 °C to form a steam layer and (v) deterring fabric ignition and preventing flames from reach the fuel by extinguishing flames with the steam layer, which is the method of claims 49-51, or further (w) dissipating the steam layer and (x) removing the barrier, as required in method claim 50, or further (y) steaming between the barrier and fuel, as

required in method claim 51. Here again, the only bridge to these claimed methods is the applicant's own disclosures, and applicant's own disclosures cannot be used to fashion a rejection on obviousness. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Summary

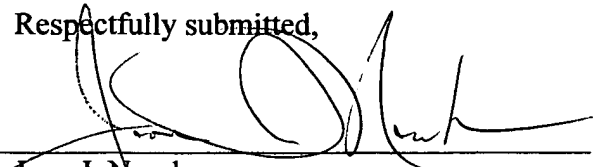
The amended claims present a self-protecting barrier system of claim 1 and its dependent claims, a self-protecting barrier of claim 14 and its dependent claims, a method of retarding fire from burning on object of claim 15 and its dependent claims and a method of isolating fuel from the flames of a fire of claim 49 and its dependent claims. Each claim is believed now to be at least a plurality of degrees removed and distinguished from Bumbarger, and any combination of Bumbarger and Rogers et al.

These claim amendments, except for the amendments for form, were not earlier presented because applicant does not read into Bumbarger the construction presented by the examiner in the Action of 02/10/2006. These claim amendments are presented now because it is believed that these amendments, in combination with the evidentiary materials and comments provided here, provide an unquestionable traverse of the rejections, resolving all issues, without excessively restricting the protection provided by the claims to applicant's invention.

Entry of the amendments presented here, discussed above, and reconsideration and removal of the outstanding rejections thereof, are also respectfully requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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